Designing for Disasters

Massachusetts Coastal Hazards Commission
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Designing for Disasters

Outline

- Resilience: What is it and Where's it Going
- Massachusetts Coastal Hazards Commission Recommendations
- Examples of Projects Addressing Recommendations
- Opportunities for Action
- Next Steps

Resilience is about building the capacity to bounce back

Rather than reacting exclusively to easily identified vulnerabilities. . .

The concept of resilience emphasizes local strengths and capabilities – cultivating those community elements that can make the biggest difference between a crisis and a catastrophe

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Forward Thinking

- **Building resilient communities through networks to decrease risks**
- **Ecosystem-based approach**

  "The capacity of a system, community, or society potentially exposed to hazards to adapt in order to reach and maintain an acceptable level of functioning and structure."

- **Capacity for forward planning (adaptive capacity management)**
- **Local government – Planning, Zoning, and Permitting**
- **Current and Future Efforts, Policy**

Resilience in Massachusetts?

• May not be called resilience. . .But your efforts, recommendations, and actions show capacity building and cultivation of community strengths

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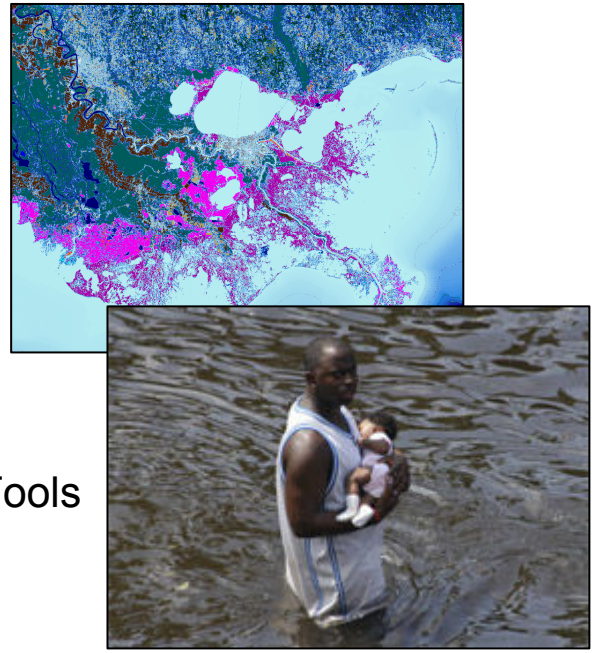
Community Resilience Initiative

Provides a framework for communities at all levels to assess and improve their resilience to hazards

Major Elements of Initiative

- Building a National Community Resilience Knowledge Network
- Comprehensive Community Assessment Index
- National Performance Assessment Index
- Providing Community Resilience Assessment, Planning & Policy Tools



What's A Community Resilience Index

- Define key resilience factors
- Identify critical interdependencies
- Enable community-based adaptive management techniques
- Collaborative partnerships between a wide range of entities

Physical Capital

- Physical capital comprises adequate shelter, buildings, water and sanitation, tools, transport, energy and communications

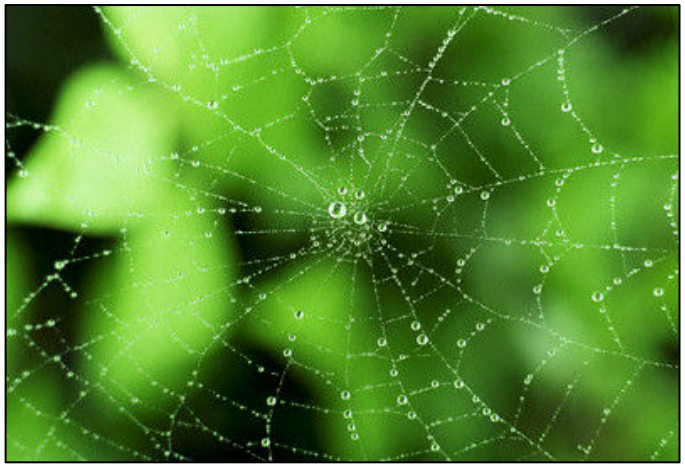
- ‘Lifeline‘ infrastructure in at-risk areas, such as hospitals, emergency headquarters, schools and shelters, should be resistant to disasters serving both a protective and symbolic function

Economic Capital

- Economic capital (savings, income, investments, credit) increase the capacity of individual and communities to absorb disaster impacts and speed recovery

Human Capital

- Human capital (knowledge, skills, health, education, physical ability) determines individual resilience more than any other asset



Social Capital

- Social capital (reciprocity, affiliations, trust) includes networks that provide informal safety nets during difficult times and help people access resources urgently needed after disaster

- The most resilient communities are those which work together towards a common aim

- Creating community consensus is as valuable as building physical infrastructure

Natural Capital – The Link to Land Conservation Strategies

- Natural capital including water, land, and natural resources are essential for human survival
- Environmental change and degradation can significantly change the potential impact of disasters on all community assets
- Some natural assets are also directly vulnerable to the impacts of hazards, causing cascading system failures

Measures to increase environmental resilience can provide significant benefits related to physical, economic, and social capital

Massachusetts Coastal Hazards Commission

Recommendations for policy, regulatory, and statutory changes have elements of resilience

- You understand the issues; Realize the importance of being proactive
- You have stepped up to the plate to develop a commission, recommendations
- Identified critical issues in your state
- Done all this in a short period of time (Accomplished a lot!)
- Others can learn from your process and forward thinking
- Obtaining feedback on recommendations; Prioritizing next steps for action

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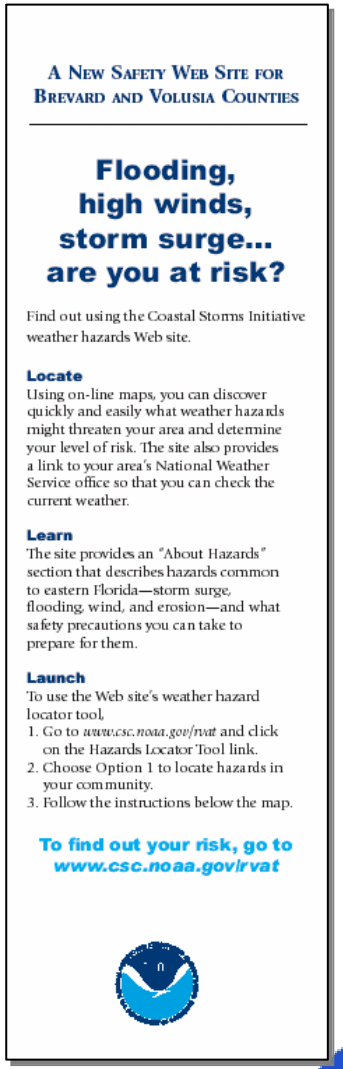
Where To Focus Efforts?

- Remapping flood zones; include erosion hazards
- High resolution, integrated topographic/bathymetric data; updated consistently
- Integrated coastal and ocean observation systems
- Web-based, interoperable systems for data delivery
- Education and outreach (really understanding the needs)
- Risk conveyance (do people understand their risks)
- Communication and partnerships
- Land use, conservation, and comprehensive planning



A New Safety Web Site for Brevard and Volusia Counties

Flooding, high winds, storm surge... are you at risk?

Find out using the Coastal Storms Initiative weather hazards Web site.

Locate
Using on-line maps, you can discover quickly and easily what weather hazards might threaten your area and determine your level of risk. The site also provides a link to your area's National Weather Service office so that you can check the current weather.

Learn
The site provides an "About Hazards" section that describes hazards common to eastern Florida—storm surge, flooding, wind, and erosion—and what safety precautions you can take to prepare for them.

Launch
To use the Web site's weather hazard locator tool,
1. Go to *www.csc.noaa.gov/rvat* and click on the Hazards Locator Tool link.
2. Choose Option 1 to locate hazards in your community.
3. Follow the instructions below the map.

To find out your risk, go to *www.csc.noaa.gov/rvat*

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Coastal Hazards Data, Tools, Education, and Outreach

NOAA Storm Surge Action Plan

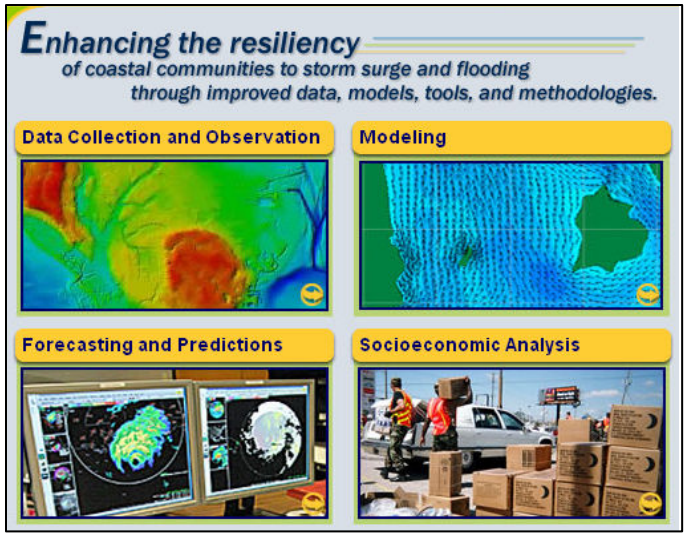
Recommendations for improving storm surge products

- Develop a common set of definitions among NOAA and other agencies
- Implement a community-modeling approach to create the next generation storm surge modeling and forecasts
- Create local and Web-based training for users and the media, improve decision-support tools

Storm Surge Partnership Project

Working to enhance the resilience of Gulf of Mexico coastal communities to inundation by:

- improving storm surge and coastal flood forecasts, warnings, and response capabilities
- acquiring and enabling access to high-resolution topo/bathy data
- demonstrating future storm surge model efforts
- developing innovative decision-support tools



www.csc.noaa.gov/sspp

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Coastal Hazards Data, Tools, Education, and Outreach

Community Vulnerability Assessment Tool

Community approach to risk mapping, mitigation prioritization, and education

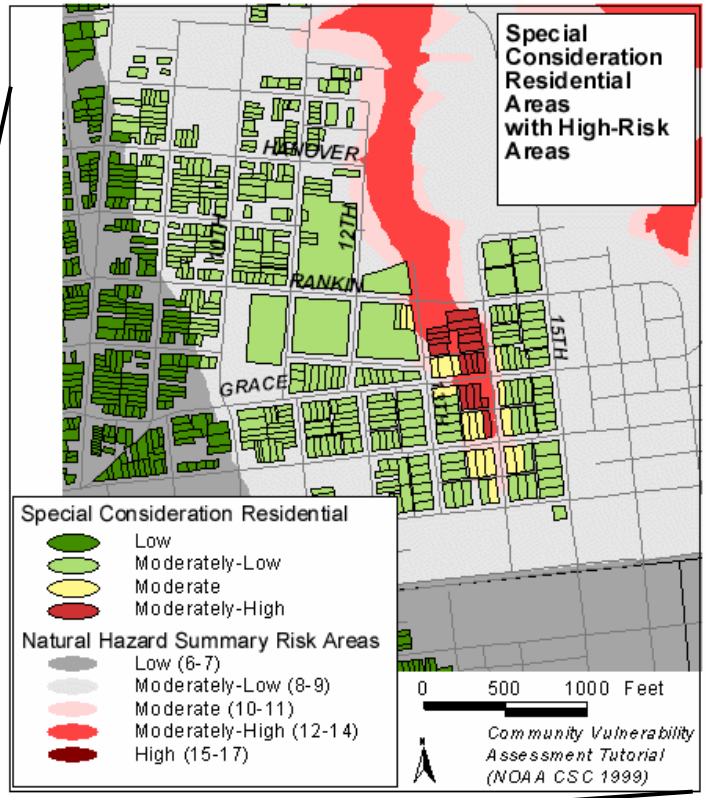
Input Data

- Hazards and Threats
- Societal
- Economic
- Infrastructure
- Environmental
- Unique features

→ **Analysis**

Output Data

- Spatial relationships of all aspects of a community
- A tool for community self-assessment of resiliency
- Prioritized mitigation strategies



www.csc.noaa.gov/rva_tools

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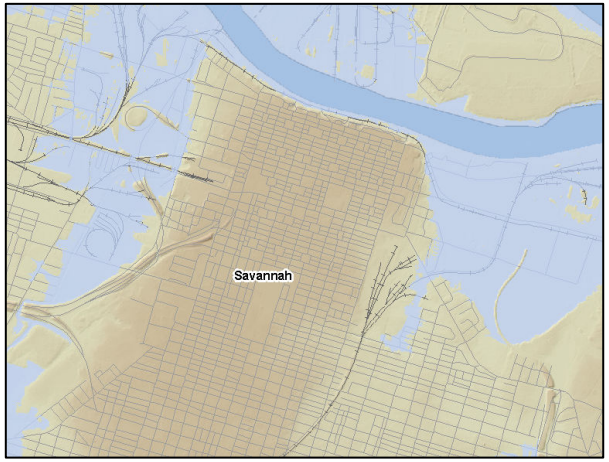
Comprehensive Hurricane Preparedness Study



- Storm surge remapping with higher resolution data
- GIS extension: ability for application in other areas
- View and interact with hazard mitigation data via Internet

Multi-Hazard Risk Mapping

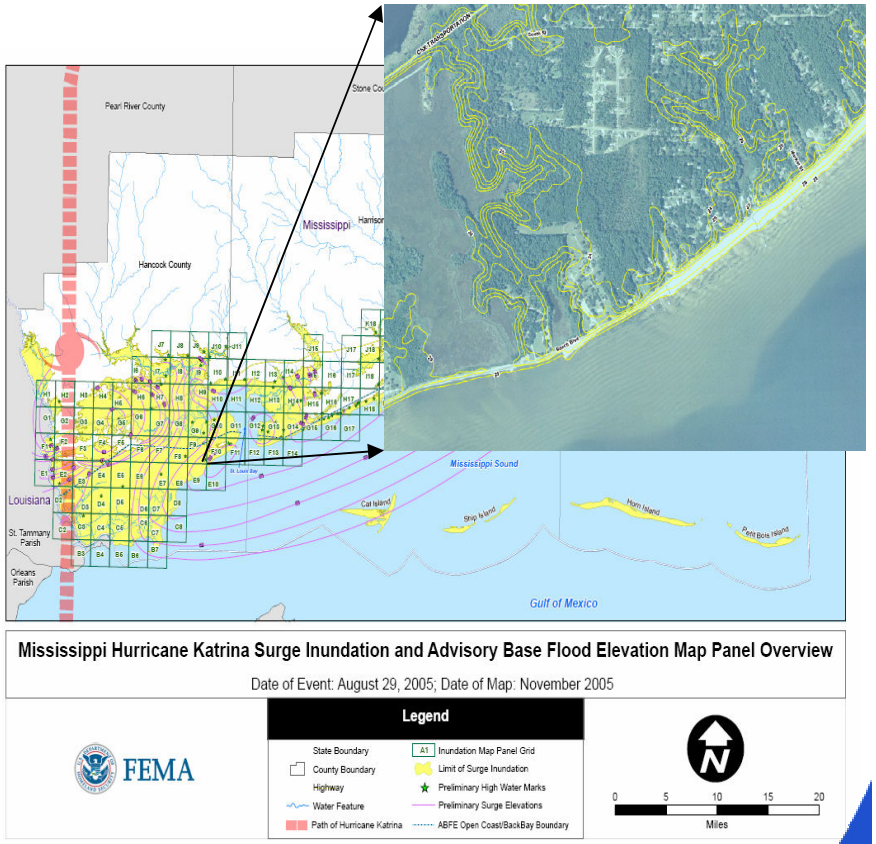
- High resolution data, latest spatial technologies
- Providing spatial resources for communities to assess resiliency
- A series of “suitability maps” to support resilient redevelopment along the Gulf Coast

Post 2005 Hurricane Season Coastal Flood Recovery Maps

- **FEMA working with state and locals to develop maps that provide**
  - Advisory base flood elevations (ABFEs)
  - Flood inundation limits; high-water mark elevations

- Aid state and local officials, homeowners in identifying existing and increased flood hazards from past 25 years of storms for that area

- ABFEs provide recommended building elevations for redevelopment process



www.fema.gov/hazards/floods/recoverydata/katrina_la_index.shtm

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Association of State Flood Plain Managers No Adverse Impacts: Coastal Handbook

- Guidelines and principles for a "Do No Harm" approach to managing coastal areas

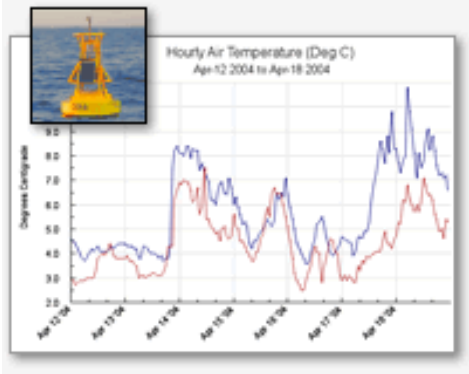
- Communities understand approaches to better manage coastal development, hazards, and ecosystems

Collaborative Regional Governance

- Gulf of Mexico Alliance: State-led process, supported by Federal government, *Collaborative regional governance*

www.gulfofmexicoalliance.org

- Developed the Governor's Action Plan to focus on regional issues



Northeast Regional Examples of Collaboration

- Northeast Regional Ocean Council (NROC)
- Gulf of Maine Ocean Observing System (GoMOOS)
- Northeast Regional Association of Coastal & Ocean Observing Systems (NERACOOS)

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Coastal Hazards Data, Tools, Education, and Outreach

Conservation and Land Use Planning

Maine Coast Protection Initiative

- *Land Trust Alliance Partnership*
- Balancing pressures of growth and development in coastal watersheds
- Working to increase the pace and quality of strategic coastal land conservation

Alternatives for Coastal Development

- Illustrating through 3D visualizations and geospatial technology different coastal development scenarios that address questions about growth and development along the coast

NOAA, Land Trust Alliance, The Nature Conservancy

- Hazard mitigation through conservation

The cost of implementing local land-use controls and following stringent building codes is miniscule compared to the many billions of dollars that it costs the U.S. taxpayers for disaster relief and reconstruction.

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Challenges: Policies and Practices

What's Keeping Us From Lessening Our Vulnerabilities?

- Past practices: Building in high hazard areas; Development techniques
- Haphazard planning
- Development patterns
- Focusing on the short-term
- Understanding how people grasp risk

Siting and Construction of Infrastructure

- Current policies enable rebuilding in hazardous areas
- Need local input when applying national programs/policies

Construction Methods and Materials

- Design and construction techniques don't withstand natural hazards
- Current building codes: issues with implementation

Are We Designed for Disasters?

Opportunities For Change

- Establish building codes relevant to hazard type
- Educated decision-making (zoning, permitting,)
  - Less costly to prevent problems than to remedy them
- Planning at all levels
  - National programs need local input
- A community approach to managing ecosystems
- Engage many to find solutions
  - Who should be involved?
  - Look for future opportunities to work together

Mitigation is an investment, not an expense

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Next Steps: Keeping Your Momentum

Critical Point

• Critical point in the process; Prioritize recommendations

• Take action to demonstrate seriousness of your hard work

• *Need an executable implementation strategy*

Develop Collaborative Regional Partnerships

• Connect to other states, think regionally

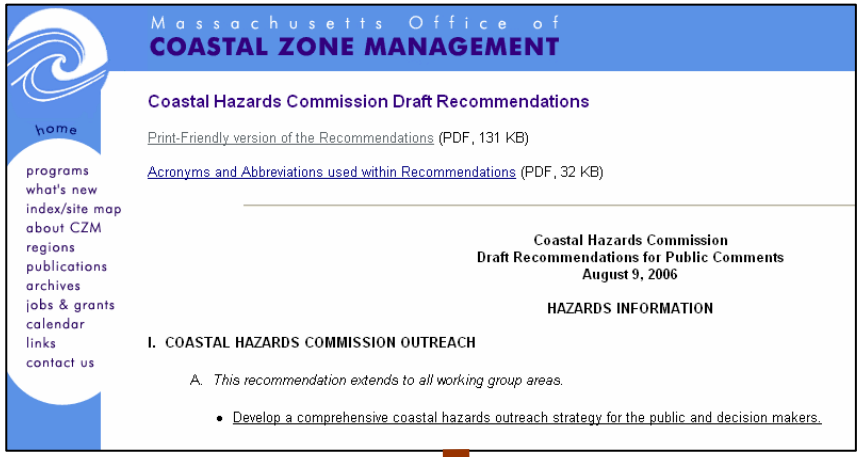
• Share your methodology and process

• Leverage resources ($$, time) to increase federal agencies support potential

Obtaining National Support

• Show willingness to share costs; come with a plan; work with others

• Make connections between hazards, land use and conservation planning



IMPLEMENTATION

Investment in hazard mitigation = Investment in future health of Massachusetts